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It is only very recently that cases of septic peritonitis, and of pus free or encysted, within the serous membrane of the abdomen, have been systematically treated by abdominal section and drainage. Within the past three or four years, however, quite a number of such operations have been reported, particularly by those engaged in abdominal surgery. But this number is still so small, and the indications for operative interference so indistinctly defined, as to lead me to hope that a report of additional cases will be interesting.

The consideration of pelvic abscesses might properly come within the scope of this paper, as a portion of them, at least, are intra-peritoneal collections of pus. Many of them, too, have been treated by abdominal section and drainage. A portion of these operations have been, undoubtedly, laparotomies, according to the general acceptation of this term, while in other cases the operation has not differed from the opening of other abscesses that have pointed externally. I shall omit all discussion of pelvic abscesses, with the exception of those rare cases in which the pus has escaped into the cavity of the peritoneum.

To the treatment of retro-peritoneal, peri-typhilitic and other extra-peritoneal abscesses, I wish to call your attention only in the event that they have become intra-peritoneal by escape of pus into the peritoneal cavity—an accident that is far more frequent with these than with the pelvic abscess.

As an introduction to the consideration of my subject, I desire to present, with as little detail as possible, the three following cases. Two of them are illustrations of the circumscribed peritoneal abscess; the third is an example of the irruption of pus, that had formed elsewhere, into the peritoneal cavity.

Case I.—Under the care of Dr. Lane, of Billerica, to whom I am indebted for the following history: "J. L., a young man; age 19. At the time of my first visit, April 3, 1884, he was suffering from a general condition of fever. Pulse, 100; temperature, 102°; bowels constipated and tender upon pressure. This condition continued about ten days, save a fluctuating temperature. Then the bowels began to enlarge, with increasing tenderness on the left side of abdomen, and with decided dulness on percussion. From this time the pain, tenderness, and fulness of the left side steadily increased. The pulse and temperature varied greatly from day to day, the former ranging from 100 to 130, the latter from 100° to 104°."

May 3d, I saw the patient with Dr. Lane. At this time there was marked prostration from general septic poisoning. The pulse, 120; temperature, 103°. Over the left anterior portion of the abdomen, extending about two inches to the right of the umbilicus, and distending the parietes, could be felt a fluctuating mass, uniformly oval, and dull on percussion. An abdominal incision three inches in length was made, through which escaped about three quarts of an odorless, purulent liquid. An examination through the incision demonstrated the parietal peritoneum, and, with the hand in the pus cavity, there could be felt on the right side, the agglutinated coils of intestine and the fibrinous partition wall that separated the abscess from the remaining portion of the peritoneal cavity. Although neither the previous history of the case nor our examination revealed the cause of the abscess, yet its intra-peritoneal origin was clearly shown.

After the cavity had been thoroughly washed out with a mild antiseptic solution, a drainage tube was inserted, and the usual dressings applied. In a few days the pulse and temperature became normal, and the patient went on uninterruptedly to recovery, which was complete in two months after the operation.

Case II.—N. P., Lowell, man aged 26. A patient of Dr. Chadbourne. In the latter part of December, 1886, an abscess, not due to any appreciable cause, pointed just below Poupart's ligament on the right. This was opened with the bistoury, and about eight ounces of pus escaped. The pus track extended over the os pubis and deeply within the pelvis. The abscess was evidently extra-peritoneal, and originated somewhere in the pelvic cavity.

Three months later there appeared on the left side a moderate distension of the abdominal walls. Over a well-defined space were dulness and fluctuation, but no tendency at any point to a spontaneous opening of the abscess appeared.

An incision three inches in length and four inches to the left of the median line gave exit to about three pints of a thin offensive pus. The cavity was washed out, a glass drainage tube inserted, and the remainder of the wound closed with sutures.

The patient has made an entire recovery so far as the peritoneal abscess is concerned. From the pelvic abscess a slight discharge of pus still continues along the fistulous track.

In attempting to solve any possible doubt as to the intra-peritoneal origin of this second abscess, I explored with my hand the pus cavity, but so profuse a hemorrhage from the partition walls followed my manipulations, that I was obliged to desist.

I concluded, however, that its site was intra-peritoneal, and have so classed it for these reasons: Because the anterior boundary seemed to be the parietal peritoneum,

thickened and covered with a lymph and fibrinous deposit; because the contained fluid had the gross appearances usually found in the encysted purulent effusions of a localized peritonitis; and, because the hemorrhage, that I mentioned, would readily come from intra-peritoneal adhesions, but would not certainly be expected from the walls of an extra-peritoneal abscess.

Case III.—This patient was under the care of Dr. Trueworthy, of Lowell, who has kindly prepared for me the following report of the case up to the time of operation:

"Mrs. D., of Lowell, age 25. August, 1881, was thrown from a carriage and dragged a considerable distance. After the accident she suffered from great pain and soreness in the lower part of the bowels, and from a menorrhagia that continued about five weeks. Mrs. D. was married in the fall of 1881, but has never been pregnant. In July, 1882, she had an attack of pelvic cellulitis, from which she recovered slowly and imperfectly. From this time her menstruation was irregular and her general health somewhat impaired. April, 1885, she had an attack of perimetritis that continued with varying severity till July 10th, when I saw her for the first time during this illness. The uterus was enlarged and tender on pressure. A solid mass occupied the posterior cul-de-sac. Over the lower portion of the abdomen there was a general feel of fulness. The bowels were slightly distended, and the patient complained of severe pain at the lower part of the abdomen. Temperature, 103°; pulse, rapid. The acuteness and severity of the symptoms to quite an extent subsided during the succeeding few weeks, but the pelvic effusion remained and increased. August 20, Mrs. D. had a chill, followed by a rise of temperature and an increased severity of the general symptoms. Vomiting became frequent, and the swelling in the hypogastric region reached nearly to the umbilicus. Temperature varied, sometimes reaching 104°. The gen-

eral emaciation and debility had increased up to September 7th."

At this date I was called by Dr. Trueworthy to see Mrs. D. on account of an alarming prostration that had suddenly supervened. The extreme pallor, anxious expression, and feeble pulse of our patient indicated plainly enough that some grave accident had befallen her.

Stimulants were freely administered, and an hour later an incision along the median line, four inches in length, was made. A considerable amount of pus, at least one quart, was found among the coils of intestines and in the dependent portions of the peritoneal cavity. This pus had come from the rupture of a pelvic abscess, whose existence the preceding history of the case has so clearly indicated.

The entire cavity was thoroughly washed with large quantities of warm water. A long drainage tube was carried well down behind the uterus, and the rest of the abdominal wound was closed.

During the operation it became necessary to sustain the patient with frequent subcutaneous injections of brandy. She bore the shock badly, and rallied very slowly. She went on, however, without any incident worthy of mention, to a recovery that was complete six months after.

In considering the surgical treatment of those effusions more or less purulent, occasionally encysted, oftener diffuse, that one finds in the abdominal cavity, their origin and mode of occurrence become an important subject of inquiry: First, we find pus within the peritoneum from the rupture of an ovarian cyst, of a pyosalpinx, of a pelvic abscess (as in the case just described), from perityphlitic, hepatic and other extra-peritoneal abscesses, that have discharged their contents in this direction. Second, more frequently circumscribed peritoneal abscesses are found, which, in other words, are localized peritonites with purulent encysted effusions. In a third class of cases we find the pus a product of a diffuse purulent peritonitis.

Therefore, in discussing the treatment appropriate to those cases of pus within the peritoneum, we are compelled to consider also the various forms of peritonitis, since the latter, in the vast majority of instances, stands in a causative relation to the purulent effusion.

By a somewhat hurried search through the recent medical literature within my reach, I have found reported the three following cases, nearly analogous to Case III. of this paper:

Case I.—Operator, Sonnenburg.[1] A large peritonitic exudation had broken into the abdominal cavity, several weeks after the confinement of the patient. A very acute peritonitis was at once excited. Laparotomy, careful cleansing of the peritoneum, drainage, recovery.

Case II.—Mr. Treves.[2] Woman, 21 years of age, with a pelvic abscess following gonorrhœa. At the time of operation the abdomen was tense, tympanitic, distended, and painful on pressure. Upon opening the cavity an acute diffuse peritonitis was found. A quantity of semi-opaque fluid, lymph and pus poured out. Pus welled up from the depth of the pelvis. It was found that a pelvic abscess upon the left side had ruptured into the general peritoneal cavity. Drainage was employed. The patient recovered.

Case III.—Lawson Tait, 1883.[3] The summary of this case I quote from the very exhaustive treatise upon "The Surgical Treatment of Peritonitis," published recently by Dr. H. Trier, of Lyons: "Young woman of twenty years. The existence of peritonitis was not doubtful, and there were also signs of intestinal obstruction. A peritonitis from salpingitis is suspected, for the patient received two years before a violent blow upon the abdomen. Laparotomy; much pus in the peritoneal cavity; pelvic organs agglutinated. No intestinal obstruction. The right fallopian

[1] Arch. f. Gynæk. 1885.
[2] Medico-Chirurg. Trans. London, March 10, 1885.
[3] British Med. Jour. 1883.

tube contained pus and had been ruptured. Cure. At the end of several weeks there exist some morbid symptoms that are difficult to describe precisely." These few cases, only four, are indeed of very little value in estimating the measure of success that will follow the treatment of extra-peritoneal abscesses that have broken into the peritoneum, by laparotomy and drainage. In another way they have a great value, for they indicate, as clearly as a much larger number could do, the only mode of treatment that offers in this condition any promise of success.

When other bodies gain access to the peritoneal cavity, they excite a peritonitis more or less acute, and usually a pus-forming one. The degree of acuteness and purulence is in direct ratio to the septicism of the foreign material. The rupture of bladder, intestines, liver, or other visceral organs by blows, the penetration of them by wounds or missiles, produces a diffuse septic peritonitis.

Perforation of stomach or bowels by ulcerations, as in gastric ulcer, typhoid fever, or dysentery, is followed by peritoneal inflammation very purulent and septic. In obstruction of the bowels from various causes, in which no perforation has taken place, we often find a pus-producing peritonitis.

In quite a large number of these cases, laparotomy has been done for the cure of the existing lesions and only indirectly for relief of the peritonitis. Quite a proportion of them have recovered. Thus laparotomy has cured not only the lesion, for which it was made, but the peritonitis as well.

Excluding those cases in which the patient died soon after the surgical interference, the recorded histories show, usually, that the peritoneal inflammation has been entirely relieved or favorably modified by abdominal section and toilet of the peritoneum.

Peritonitis of a very septic character and with rapidly fatal tendency is not infrequently produced by the rupture

or degenerative inflammation of ovarian cyst walls. In 1868, Wiltshire operated successfully for the removal of a gangrenous cyst that had caused a most formidable peritonitis. A short time before, Keith had also had one of these cases that recovered. And, to-day, I believe it is agreed among ovariotomists that the advent of peritoneal inflammation is a most urgent indication for ovariotomy. A large proportion of the patients in this condition in the hands of Keith, Tait, Homans, and others have recovered. That is, not only the tumor has been removed, but the peritonitis, too, has been cured. I think that no more conclusive proof of the utility of laparotomy for the treatment of peritoneal inflammation could be adduced, than these facts afford.

In localized peritonitis with encysted effusions, or, as Mr. Bennett has more happily designated them, encysted peritoneal abscesses, there can to-day be no question as to the propriety of immediately evacuating their purulent contents. The only question can be, in regard to the best mode of doing this. For the purpose of showing the excellent results that have followed the treatment of these abscesses by laparotomy, I avail myself of the statistical researches of Dr. True:

He gives, somewhat in detail, the histories of ten cases. One of them is that by Dr. Adams, of Framingham; another by Dr. Wilson, of Maryland. To these I have six to add, as follows:—

One, by Lawson Tait.[1] Abdominal section was made, and three distinct peritoneal abscesses were found. After the operation, the temperature became normal. At the time of writing, the patient had not entirely recovered.

The second, by T. G. Thomas.[2] Laparotomy, drainage, recovery.

[1] Lancet Feb. 20, 1886.
[2] Reported by Buckmaster, Journal Medical Sciences, April, 1887.

The third, by Dr. Watson.[1] A woman, aged 58; supposed to be suffering from an ovarian tumor. Six quarts of pus escaped through the abdominal incision, and the finger passed into a cavity, at the bottom of which the pelvic organs were felt, covered with flocculent lymph; while above, the wall of the abscess formed a complete partition between the cavity and the intestines. A drainage tube was used, and the patient made a good recovery.

The fourth, by Dr. Homans. Case not published. Mrs. S., age 28. In January, 1882, began to suffer from pain and tenderness of the abdomen, and from slight fever and diarrhœa. These symptoms continued till July, when a fluctuating abdominal tumor was found. Percussion note dull anteriorly, resonant in the right flank, less so in the left.

Aug. 3d, 10 lbs. of pus were withdrawn with the trochar. Aug. 9th, an abdominal incision, four inches in length, was made, giving exit to eight pounds of pus. Abscess cavity was washed out and drainage tubes were inserted. The patient recovered in about four weeks after the operation.

The two remaining cases are reported above.

The sixteen cases give these results:—Twelve recoveries, three partial recoveries, and one death.

Peritoneal abscesses, in the past few years, have often been treated by evacuation of their contents with the aspirator. Exceptionally by one or more aspirations a cure has been obtained. Generally, however, the sac refills as often as it is emptied in this way. Several of the above cases were first treated by aspiration, but afterwards it became necessary to make abdominal section and employ irrigations and drainage of the pus cavity.

The lessons, as to the management of encysted peritoneal abscesses, which the histories of these sixteen cases seem to teach, are, that the following treatment is not only appropriate, but that it is almost uniformly successful. The

[1] Glasgow Medical Journal, 1886.

operation should be performed as early as possible, to prevent the progressive loss of strength by the patient and to avert the danger, always present, of a rupture of the abscess walls. An incision, anywhere through the abdominal walls, should be made over the most prominent part of the tumor. This should be done carefully, and all hæmorrhage arrested before the peritoneum is opened. After the purulent liquid has escaped and the pus cavity has been thoroughly irrigated with a mild antiseptic solution, a drainage tube is inserted and the remainder of the abdominal wound closed. I favor this rather free incision, both to facilitate the escape of pus and to allow a thorough examination of the pus cavity, if this should seem desirable. Should such an examination be made with the hand, great care is necessary, for the partition walls of organized lymph bleed very readily and freely.

Acute diffuse peritonitis not due to the escape of pus or other abnormal material into the abdominal cavity, nor to puerperal sepsis, is less frequent than the localized form that has just now engaged our attention. It has, however, great interest for the surgeon, for its natural course is extremely fatal, while surgical interference has shown itself able to save more than one half of these patients.

General acute peritonitis does, undoubtedly, occur in which there is no effusion of liquid. Such instances, I believe, are very rare. Of this subject Dr. Treves says, "Purulent peritonitis is the usual form of acute inflammation of the peritoneal serous membrane," and he further quotes Bennet as saying that an acute inflammation of the peritoneum never produces a transparent serous fluid, and that this rule is without exception. That is, that the effusion, which almost always occurs, is to a greater or less extent purulent.

Therefore in this, as in the preceding classes of cases that we have passed in review, the surgeon has to deal with pus in the abdominal cavity. The results thus far obtained by abdominal section, as stated by Dr. B. F. Curtis, are slight

recoveries (to which may be added one by Dr. Marcy, of Cambridge, and one by Buchanan, of Glasgow) and three deaths. In the latter the operation was performed too late to be of any avail.

Tubercular peritonitis is so widely separated by its cause and course of development from the other forms of peritoneal inflammation that we have considered, as to render it a very distinct affection. Yet as the surgical treatment of it, entered upon sometimes through a mistaken diagnosis, has given some brilliant results, it seems important to refer briefly to a few of these cases and note the existing conditions in which laparotomy has been able to effect a cure or great amelioration. At first thought, recalling the pathology of this affection, it would seem impossible that any surgical interference could be other than disastrous. Still, when we remember that many tuberculous joints have been cured by free incision and drainage, this treatment as applied to the abdominal cavity becomes more reasonable.

Spencer Wells[1] reports two cases. In both there was a large amount of liquid. In the first it was serous, in the second of greater consistency but not pus. The peritoneum was covered with tubercular granulations. Both patients recovered and continued in good health after the operation. Lanois reports a case in which he made an abdominal section. The effusion was purulent. Patient recovered.

Dr. Wylie, of New York, reports two cases cured by laparotomy and drainage. Before this Society in 1885 Dr. Homans gave the history of one in which he made an exploratory incision that was followed by an excellent recovery. Several other successful cases have been recorded.

In all of them there was quite a large effusion of liquid, sometimes serous, oftener sero-purulent. Thus the tubercular form has had one condition in common with the other

[1] Tumors of the Ovaries and Uterus—Wells.

peritonitis, namely, liquid in the peritoneal cavity, and this often containing pus elements.

The patients that recovered were in fair general health, and the only local manifestation of the tuberculous diathesis was in connection with the peritoneum.

An article treating of the various classes of pus-forming peritonitis and omitting all consideration of the puerperal, the most septic and purulent of all, would be a very incomplete one. But I have already so trespassed upon your time, that I must be content with a brief reference to a single form of puerperal peritonitis. I refer to that which follows abortions either accidental or induced, but which exceptionally is seen after labor at full term. Showing itself at a later period after the parturient act, than is the rule with more acute peritonitis, it commences with abdominal pain, increased temperature and pulse rate, all in moderate degree. Tympanites more or less marked is always present. All these symptoms become progressively more severe. Vomiting and diarrhœa supervene, the features gradually acquire a pinched and anxious look, the pulse becomes thready and very rapid, the extremities cold, and the patient dies a few days after the commencement of the attack.

I have made three autopsies in cases of death from peritonitis after abortions. In all of them the post-mortem appearances have been very uniform. I have found from five to ten ounces of thick purulent liquid free in the peritoneal cavity, the intestinal folds bathed with pus and agglutinated more or less by fibrinous adhesions, and the general peritoneum deeply congested, especially in the vicinity of the pelvis. Dr. Draper, Medical Examiner at Boston, in reply to a letter describing the conditions mentioned above, and asking the result of his larger experience in these cases, writes as follows:—"My observations correspond closely with *your own*, in the pathological conditions usually resulting from criminal abortion.

"In nearly all the cases in which death resulted from secondary complications, and not during or immediately after the operative interference, I have found the cause of death to be peritonitis with the post-mortem appearances which you describe. Usually I have traced the course of events in *this way:* a sloughing placental site, endo-metritis, salpingitis by continuity; finally peritonitis. My cases number twenty-seven, of which more than half have peritonitis written after them."

Upon this subject Dr. Harris, Medical Examiner, says:—"An examination of my records of autopsies for the past ten years shows, that generally, after death by abortion, I have found extensive peritonitis, the intestines glued together and to the peritoneum. The abdominal cavity has contained a large quantity of offensive pus. The pus was largest in amount in those parts of the abdomen to which it would naturally gravitate. There has also been, generally, metritis and salpingitis, on one or both sides. In cases where death has occurred early, the appearances mentioned above have been much modified, or altogether absent."

Against this form of purulent peritonitis, medical treatment has no resources. It is in every instance necessarily fatal. I know of no case in which surgical interference has been attempted, in the treatment of peritonitis following abortion. Yet, since abdominal section with irrigation and drainage of the peritoneal cavity, as we have seen, has combatted successfully other forms of peritonitis, septic and purulent like this, I think we may reasonably hope that laparotomy may, in the future, save at least a portion of these unfortunate patients.

Mr. Tait, who can speak upon the surgical treatment of peritonitis in general with the authority of an experience greater than that of any one else, says, in a written communication to Dr. Truc—

"In the presence of a grave peritonitis, I occupy myself but little with its cause and character. I first freely open the abdominal cavity, and then conduct myself according to the indications furnished by direct inspection."

Finally, an investigation of the causes that give rise to purulent effusions within the peritoneum, and a consideration of the results obtained by surgeons up to this time by laparotomy, tend to the conclusion, that, wherever pus exists in the cavity of the peritoneum, our only resources are in abdominal section, irrigations, and drainage.

The further lesson unmistakably taught, is, that this simple operation will have a more extended field of usefulness than almost any other that has been an outgrowth of the parent operation, ovariotomy.